



Case Report

The interaction of injury and disease in the elderly: A case report of fatal elder abuse

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ABSTRACT

We report a case of an elderly demented woman who died of a mitral rheumatic valvular disease in the context of multiple injuries and from elder abuse. History from police investigation indicated that the deceased was found collapsed on the floor in her bedroom for several days prior to death by her son who did not initiate medical care. Autopsy revealed a frail elderly woman with Alzheimer's disease and evidence of multiple healing sublethal blunt impact injuries of the face, mouth, neck, upper chest, and extremities. In addition, there was unwashed dirt encrusted skin, urine/fecal staining of skin and clothing, dirty overgrown toenails, and matting of the hair. This constellation of findings supports the medical diagnosis of elder abuse with neglect. However, the immediate cause of death was the left-sided congestive heart failure from mitral rheumatic valvular disease. Although the underlying cause of death was related to the chronic cardiac condition, the physical abuse and neglect was considered significant contributing factors to death, since physiologically the injuries and lack of medical treatment was thought to have hastened death by exacerbating the underlying heart disease. This case underscores the need for the forensic pathologist to consider contextual variables and sublethal injuries in cases where the causal interpretations benefit from a more holistic approach. Otherwise, cases like such as the one reported can go unnoticed and certified as a simple natural death.

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1. Introduction

Elder abuse is defined as the physical, sexual, psychological, or financial maltreatment of a person made vulnerable by advanced age.¹ There are direct conceptual parallels between elder abuse and the more readily recognized and publicized physical abuse of children and infants such as occurs in the 'battered baby syndrome'. Indeed, elder abuse was once denoted 'battered granny' syndrome although a less pejorative approach to terminology is now unifying the abuse of all vulnerable victims including those at the extremes of age of 65 years and older and people with underlying developmental conditions, chronic disease, or mental handicaps. Such vulnerable people usually depend on some form of state-sponsored care or have caretakers that are biological relatives (e.g., parents of children, or offspring of the elderly) with a legal duty of care. Sometimes abuse may take the form of neglect of medical or nutritional needs of the vulnerable person, thus resulting in starvation, increased susceptibility to infection, and hampered healing.^{2–4} In the United Kingdom, the first prevalence study on elder abuse was completed in 1991. The physical and financial abuse reported by elderly at 95% confidence interval was 94–505 per 1000

population. Canada records higher rates for financial abuse, whereas UK records higher rates for verbal abuse.^{5,6}

Elder abuse and neglect presents two important challenges to the forensic pathologist. First, until recently elder abuse neglect has not been widely recognized by forensic pathologists and has probably gone undetected.² This is analogous to cases of child abuse, decades ago. Second, it is often a daunting task to arrive at cause of death in elderly people that have several potential variables contributing to death, such as injury, disease, and poor nutrition.⁷

We report a case of death of an elderly frail woman where the immediate cause of death was natural but elder abuse and neglect played a significant contributing role in the events leading to death. This case illustrates the need of a careful approach of deaths in elderly people where the elder abuse and neglect can often go unnoticed in the presence of an obvious natural anatomical cause of death.

2. Case report

A 78-year-old woman lived in her home with her son since 1970 until her death in early 2006. Since her husband died in 1995, her son became her caregiver due to advanced age and cognitive impairment. There was a past medical history of a heart

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murmur since childhood and a history of iron deficiency anemia. Initially, after her husband's death she had no significant cognitive impairment, but in middle of November 2005 her general health and mental status progressively declined over subsequent months.

Her son's account of the last few days of her life followed a chronology seems reasonably accurate based on correlation with the postmortem findings indicated below. He found her lying on the floor when he returned from work on a Monday. She was in her room, at the foot of the bed. She would not move from her position. He struck her and kicked her at this time. On Tuesday and Wednesday she remained in the same position and there was no evidence that she had been ambulating during the day. Thursday morning dribbled some water in her mouth before going to work. He returned from work on Thursday and found her dead. She had been lying in the same spot on the floor since the Monday.

The autopsy revealed that the decedent was a frail elderly woman with multiple recent and healing bruises of the face, mouth, neck, upper chest, and extremities. In addition, there was unwashed dirt encrusted skin, urine/fecal staining of skin and clothing, dirty overgrown toenails, and matting of the hair (see Fig. 1).

On the external examination the injuries were concentrated in the face: a crusted abrasion on the nose; multifocal to confluent red bruise of the tip of the nose and extending over both nasal ala; extensive left facial swelling and 19×13 cm blue-purple bruise involving the left side of the face and upper neck (some of the contused skin had pale green colour with fading margins); extensive multifocal fading green bruising of the forehead and right eyebrow along the supraorbital ridge; additional areas of facial bruising with similar features are present involving the filtrum, chin, and lower face; and areas of green contusion and swelling of the right malar eminence. In addition, there was bruising of the labial mucosa of the right upper lip adjacent to the area of contusion of the filtrum and extensive submucosal contusion involving the buccal mucosa of the left side of the mouth. Other injuries included scattered bruises of varying age over the extremities, hips, and a large crusted laceration/ulcer of the right shin. The injuries in the face corresponded to slapping in the final stages. Even though frequent falls and self inflicted injuries are the other possibilities they are less likely to cause the observed facial injuries.

The state of the nutrition and level of hydration was specifically assessed at autopsy. The stomach contained a small amount of ingested material and the colon contained stool through out the en-

tire length of the large intestine. The scanty presence of ingested material may have resulted following some food given by the son. There was no evidence of fecal impaction. The subcutaneous and visceral fat stores, although not abundant, were present and at least minimally adequate. Vitreous biochemical studies revealed marked postmortem elevation of the vitreous potassium concentration, which made definitive assessment of hypernatremic dehydration uncertain.

The heart showed diffuse calcific but subocclusive atheroma, although a focal old myocardial infarct was found in the myocardium of the left ventricle. The mitral valve showed the end-stage degenerative effects of rheumatic valvular disease with thickening of the valve leaflets, shortening, fusion of the chorda tendinae and marked left atrial dilation (Fig. 2). There was marked pulmonary oedema with froth in the tracheobronchial tree.

Histologic studies were performed on the contusions. The forehead bruise showed recent haemorrhage in subcuticular layer and at interface with deep fibrous connective tissues. An iron stain showed siderophages. The sections from the left face showed marked recent haemorrhage in muscle and subcuticular fat and around the salivary gland. An iron stain showed siderophages. The skin from left hip showed extensive haemorrhage in subcuticular layer. An iron stain showed no siderophages.

Neuropathologic studies of the fixed brain showed Alzheimer's disease with the cerebrocortical atrophy and classical histological changes including the widespread distribution of neurofibrillary tangles and neuritic plaques.

Based on clinicopathologic correlation the decedent developed progressive congestive heart failure in the days leading up to death. This explained her immobilization and poor responsiveness in the days prior to her death. It was reasoned that the multiple injuries and neglected state did not enhance the likelihood that an elderly woman would survive an episode of congestive heart failure – the stress/pain of injury and neglect exacerbated the severity of the heart failure. On this basis, the stress and deconditioned state from the injuries, starvation and neglect were factors that contributed death, on medical grounds. Death was attributed to valvular and ischaemic heart disease in a frail aged woman with Alzheimer's disease and elder abuse with neglect.

The son was charged with manslaughter. The defendant elected to have a trial by judge only. At trial, the indirect causal nexus was discussed in chief and in cross-examination. In addition, the ab-



Fig. 1. Frail elderly woman with facial bruising.



Fig. 2. Mitral valve with end-stage effects of rheumatic valvular disease and thickening of the valve leaflets.

sence of an overtly fatal injury was explored. The defendant was found guilty.

3. Discussion

Granny battering, elder maltreatment or elder maltreatment syndrome are synonyms indicating elder abuse. Elder mistreatment is likely under-detected and more often unreported compared to other forms of domestic violence; therefore, the true incidence of elder abuse is not known. It is not a new entity but is one that is recently recognized as a widespread and growing problem. Under reporting is related to the lack of detection guidelines or protocols, lack of professional awareness and the reluctance to report an suspected occurrence of elder maltreatment. In a suspected case of elder abuse and neglect, careful history and background information is equally important together with the meticulous autopsy considering features of neglect, starvation, and evidence of physical injuries in coming to the final conclusions with the autopsy findings. The same applies to the clinical forensic examination of the elderly during life.^{8–12}

The deaths from elder abuse and neglect have been recently studied, including case reports. In a study conducted in the southern half of Osaka city and surrounding areas in Japan, there was comparable number of fatalities due to maltreatment in the elderly and child abuse.¹³ In another study, elder abuse was retrospectively studied over a 10-year interval in one jurisdiction. The major conclusions on this study were multidisciplinary team approach is vital in the investigation and prevention of elder abuse and neglect, and the forensic pathologist's role in documenting body habitus during autopsy is a critical facet in the investigation.¹⁴ The present case differs from published reports mainly because there was an established natural cause of death and the elder abuse and neglect were indirect contributory factors to the final outcome of the death. More commonly, in the other reported cases, the abuse and neglect were direct contributory factors. This case is the first elder abuse death in our jurisdiction that was prosecuted on the basis of indirect causation.

One of the most difficult tasks in forensic medicine is certifying the cause of death when it is not clear or debatable. There are two schools of thoughts on causation relative to death certification: the causal chain approach and a more holistic notion of causation. In

the causal chain approach the causal factors operate in a linear chain of events whereas in holistic causation the causal elements are interacting causal variables that may not operate in a linear chain. The difference is that the holistic causal variables have different degrees of causal relevance, or significance. In contrast, in the causal chain approach, the initial event or condition is considered most relevant.⁸ In this case, the expert opinion was based on the holistic approach to causation, where the injuries and neglect adversely added or potentiated the pathophysiological effects of congestive heart failure. In addition, neglect with the malnutrition and cognitive failure from Alzheimer's disease did not improve survivability. Adequate medical care and attention of safety resulting in timely medical interventions, proper nutrition and personal hygiene will certainly improve general health and the fatal outcome at the specific time that death occurred.

A critical analysis of the holistic approach to causation in this case could address two potentially problematic issues. First, there is no way of quantifying the degree of causation in this case or cases with a similar logical structure to the cause of death opinion. This leads to an important criticism. When is an indirect cause significant or insignificant relative to the fatal outcome? i.e., what is the cut-off point for considering a potential co-cause of death as causally relevant? In the present case, the answer to this question must relate to a reasonable medical assessment of how significant the contributing factors were to the mechanism of death, i.e., congestive heart failure. Clearly, the injuries and malnourished state could contribute mechanistically to the congestive heart failure by stress on the cardiovascular system, an inadequate basal reserve, and the effects of pain. In addition, the forensic pathologists cannot work in a vacuum and limit themselves by only looking for a simple anatomical cause of death that does not recognize the complexities of the case. The latter approach would be equivalent of reducing decision-making on the cause of death to an over-simplified algorithm that does not recognize the full spectrum of information in the case. Second, in holistic causation there is a possible danger of over-inclusion, i.e., including factors that only appear to be causally relevant, but are in fact not significant contributing factors in the death. This criticism does not apply in this case based on the mechanistic analysis of how the elder abuse and neglect contributed to the congestive heart failure. This can be illustrated with a counterexample. If the cause of death was acute subarachnoid haemorrhage from ruptured berry aneurysm (excluding

considerations of ruptured precipitated by head injury), then elder abuse and neglect would not have been mechanistically contributory to death by the analysis used to determine the cause of death in this case.

In summary, we have presented a case of natural death due to a definite anatomical cause with elder abuse and neglect as a significant contributing factor. This case raises important issues related to deciding the cause of death in cases where a more holistic notion of causation is helpful to consider. This case also underscores the need for forensic pathologists to be aware of the elder abuse and neglect for that cases do not escape detection.

Conflict of interest statement

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Ethical approval

None declared.

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